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PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Masahide Yamaki, et al.	**Examiner:**	Unassigned
Serial No:	10/085,704	**Art Unit:**	Unassigned
Filed:	February 28, 2002	**Docket:**	15337
For:	LIGHT SOURCE APPARATUS FOR PROVIDING ILLUMINATING LIGHT TO AN ENDOSCOPE, AND AN ENDOSCOPE SYSTEM	**Dated:**	May 28, 2002

Assistant Commissioner for Patents
United States Patent and Trademark Office
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

In connection with the above-identified patent application, kindly enter the following preliminary amendment.

IN THE SPECIFICATION:

Please replace the paragraph beginning at page 7, line 4, with the following rewritten paragraphs:

--Fig. 5A is an illustration showing the optical system of a light source apparatus incorporating a DMD having a spectroscopic reflecting film formed thereon.

Fig. 5B is an outline for micromirrors of the DMD in Fig. 5A each having a spectroscopic reflecting film coated in its reflecting surface.--

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CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on May 28, 2002.
Dated: May 28, 2002

Mishelle Mustafa

Please replace the paragraph beginning at page 18, line 10, with the following rewritten paragraph:

--Examples of the constructions of light source apparatuses will be explained with reference to Figs. 5 to 8. Figs. 5 to 8 concern the examples of the constructions of light source apparatuses: Fig. 5 illustrates the construction of a light source apparatus incorporating a DMD as a light modulating device, i.e., Fig. 5(A) illustrates the optical system of a light source apparatus incorporating a DMD having a spectroscopic reflecting film formed thereupon, and Fig. 5(B) outlines the micromirrors of the DMD in Fig. 5A each having a spectroscopic reflecting film coated on its reflecting surface; Fig. 6 illustrates the optical system of a light source apparatus incorporating a reflection mirror having a reverse dispersion function; Fig. 7 illustrates the optical system of a light source apparatus incorporating individually separated reflection mirrors; and Fig. 8 illustrates the optical system of a light source apparatus incorporating groups of lenses for combining beams reflected by the DMD.--

Please replace the paragraph beginning at page 19, line 3, with the following rewritten paragraph:

--The optical system 50 of the light source apparatus shown in Fig. 5(A) has practically the same construction as that of the light source apparatus 5 described above, and it comprises a light source lamp 51, such as a Xenon lamp or the like, which radiates light to be provided to the endoscope (not illustrated here); a parabolic mirror 52 which has its surface coated to filter out infra-red rays, so as to remove infra-red components from the light emanating from the light source lamp 51; a DMD (Digital Micromirror Device) 53 which restricts parallel beams from the parabolic mirror 52 in the time domain; a reflection mirror 54

for reflecting a part of radiation light radiated by the DMD 53; an integrator 55 for integrating beams reflected by the reflection mirror 54; and a converging lens 56 which converges the beams uniformly integrated by the integrator 55 onto a light-incident end surface of the light guide 15.--

Please replace the paragraph beginning at page 20, line 14, with the following rewritten paragraph:

--In this example, as shown in Fig. 5(B), each micromirror 53a of the DMD 53 has a diffracting/reflecting surface 58 which diffracts light impinging thereupon. This arrangement allows each micromirror 53a of the DMD 53 to reflect an incident beam at a different angle depending on its wavelength. Thus, beams reflected therefrom vary in an angular range of ±10° depending on the angle of the micromirror upon which they impinge, with an additional diffraction component depending on their wavelength.--

IN THE DRAWINGS:

Attached is a "Request for approval of Drawing Changes" accompanying amended drawings showing the changes in red ink.

REMARKS

Applicants submit that the foregoing amendments to the specification and drawings made to correct certain typographical errors, do not introduce new matter into the application. Early and favorably consideration of the present application, as amended herein, is respectfully requested.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned **"<u>Version with Markings to Show Changes Made</u>"**

Respectfully submitted,

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TS:cm
Encl. (Version with Markings to Show Changes Made and Request for Approval of Drawing Changes)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Paragraph beginning at line 4 of page 7 has been amended as follows:

[Fig. 5 is an illustration showing the construction of a light source apparatus incorporating a DMD as a light modulating device.]

Fig. 5A is an illustration showing the optical system of a light source apparatus incorporating a DMD having a spectroscopic reflecting film formed thereon.

Fig. 5B is an outline for micromirrors of the DMD in Fig. 5A each having a spectroscopic reflecting film coated in its reflecting surface.

Paragraph beginning at line 10 of page 18 has been amended as follows:

Examples of the constructions of light source apparatuses will be explained with reference to Figs. 5 to 8. Figs. 5 to 8 concern the examples of the constructions of light source apparatuses: Fig. 5 illustrates the construction of a light source apparatus incorporating a DMD as a light modulating device, i.e., Fig. 5(A) [(a)] illustrates the optical system of a light source apparatus incorporating a DMD having a spectroscopic reflecting film formed thereupon, and Fig. 5(B) [(b)] outlines the micromirrors of the DMD in Fig. 5A each having a spectroscopic reflecting film coated on its reflecting surface; Fig. 6 illustrates the optical system of a light source apparatus incorporating a reflection mirror having a reverse dispersion function; Fig. 7 illustrates the optical system of a light source apparatus incorporating individually separated reflection mirrors; and Fig. 8 illustrates the optical system of a light source apparatus incorporating groups of lenses for combining beams reflected by the DMD.

Paragraph beginning at line 3 of page 19 has been amended as follows:

The optical system 50 of the light source apparatus shown in Fig. 5(A) [(a)] has practically the same construction as that of the light source apparatus 5 described above, and it comprises a light source lamp 51, such as a Xenon lamp or the like, which radiates light to be provided to the endoscope (not illustrated here); a parabolic mirror 52 which has its surface coated to filter out infra-red rays, so as to remove infra-red components from the light emanating from the light source lamp 51; a DMD (Digital Micromirror Device) 53 which restricts parallel beams from the parabolic mirror 52 in the time domain; a reflection mirror 54 for reflecting a part of radiation light radiated by the DMD 53; an integrator 55 for integrating beams reflected by the reflection mirror 54; and a converging lens 56 which converges the beams uniformly integrated by the integrator 55 onto a light-incident end surface of the light guide 15.

Paragraph beginning at line 14 of page 20 has been amended as follows:

In this example, as shown in Fig. 5(B) [(b)], each micromirror 53a of the DMD 53 has a diffracting/reflecting surface 58 which diffracts light impinging thereupon. This arrangement allows each micromirror 53a of the DMD 53 to reflect an incident beam at a different angle depending on its wavelength. Thus, beams reflected therefrom vary in an angular range of ±10° depending on the angle of the micromirror upon which they impinge, with an additional diffraction component depending on their wavelength.

IN THE DRAWINGS:

FIG. 5 has been replaced with the enclosed FIG. 5A and FIG. 5B.